

The aim of the workshop, on which the book was based, was to evaluate the various types of rapid mass movement (including landslides, debris flows and snow avalanches) as a source of proxy climatic evidence for the European Holocene. The synthesis provided by Berrisford and Matthews summarizes the spatial and temporal patterns of landslides, debris flows and snow avalanches in Europe; discusses the nature of climatic controls on each of these three categories of rapid mass movement, provides a summary palaeoclimatic reconstruction based on supposed phases of enhanced activity of each process and compares Holocene rapid mass movement records with solifluction records and other climatic proxies.

They conclude that the Holocene records of rapid mass movements are of too variable a quality to produce a comprehensive summary for Europe though there is considerable potential for obtaining improved records and they detect an increase in all types of rapid mass movement activity since about 5000 years BP. They affirm that rapid mass movement data do contain climatic signals but that non-climatic factors blur that climatic signal. The fact that rapid mass movement records show correlation with the Holocene record of slow mass movement and glacier variations confirms in their minds the presence of a climatic signal.

This is indeed a compelling synthesis and may well encourage further funding of relevant and related research. In this reviewer's reading of the research data reported, there were several quite strikingly contrasted conceptual models on display.

The first major conceptual model is one which has been articulated most fluently by Starkel (1985). In this volume, he reaffirms his view that frequent mass movements coincide with phases of glacier advance, solifluction, lowering of treeline and combinations of intense rainfall events, continuous periods of rain and irregular rainy years. Nine of the other contributors to this volume subscribe to this general model and are, in general, optimistic about the possibility of detecting the climatic signal in mass movement events.

The second major conceptual model is one which involves a direct exploration of the climate–landslide coupling via hydrological and geomechanical threshold exceedance. Crozier provides an effective discussion of this model. Nine of the other contributors subscribe to this model and they are, in general, less optimistic about the possibility of detecting the climatic signal, though Jonasson *et al.*, Kotarba and Baumgart-Kotarba and Crozier recommend close attention to lake sediments as a potential way forward.

Four authors make explicit use of the paraglacial model; this, after all, is a specific example of the broader conceptual model of threshold exceedance and relaxation time needed to recover from the effects of massive glaciation. Luckman and Fiske review this model and indicate the problem of elucidating a climatic signal if this model is more broadly representative.

There are two contributions on coastal mass movement events (Ibsen and Brunsden and Maquaire) and one contribution on snow avalanches (Latenser and Pfister) which are optimistic about detecting climatic signals – probably because of the directness of the relationship and the shorter relaxation times.

The remaining five chapters are generally pessimistic about detecting climatic signals for various reasons: the dominance of structural and tectonic controls (Mantovani and Kalvoda *et al.*), diametrically opposed interpretations of climatic influences on mudflow activity (Solomina) and basic agnosticism because of the complexity of the climate–hydrology–vegetation–soils–geomorphic process causal chain and urging an intensification of computer and laboratory modelling to improve our understanding before committing ourselves to chronologies and climatic inferences from mass movement events (Thornes and Brooks).

The key issue is presented by Ibsen and Brunsden: 'The actual number of dated slides is small and there is a danger that data will be selectively used if they happen to agree with our preconceived notions that a particular climate is conducive to slipping. In the U.K. archive there are several good records from the warm, dry Climate Optimum between 5500–3000 B.C. indicating that landsliding has, in fact been continuous in time and that the concentrations are imaginary' (p. 173).

This is a fine, stimulating research volume; my only concern is that the editorial team has done too good a job of sanitizing the data. There seems to be a fair division of opinion among the researchers over the wisdom of proceeding with this kind of exercise; the editors declare victory and will undoubtedly use the evidence of this volume to justify continuing the search for palaeoclimatic signals in this way. All geomorphologists will find this volume to be 'a good read'. The question for me is: 'Are the contributors to the research volume as convinced about the interpretability of their results as the editors?' At all events, the data have been compiled and all are agreed on the necessity for more. Should there not be a frank and open engagement of the supporters of the different models before the next request for funding to do more of the same thing?

References

- Church, M. and Ryder, J. M. 1972. 'Paraglacial sedimentation: a consideration of fluvial processes conditioned by glaciation', *Bulletin of the Geological Society of America*, **83**, 3059–3072.
 Starkel, L., 1985. 'The reflection of Holocene climatic variations in the slope and fluvial deposits and forms in the European mountains', *Ecologia Mediterranea*, **11**, 91–97.

OLAV SLAYMAKER
Department of Geography
University of British Columbia

TERMINOLOGY FOR SOIL EROSION AND CONSERVATION by E. Bergsma *et al.*, International

Society of Soil Science, Wageningen, 1996. No. of pages: 313. Price: 20 NLG. ISBN 90-71556-15-8.

This is a glossary which defines, describes, explains and puts in context terms used in the study, prevention and treatment of soil erosion by *rain*. It groups terms into 'central concepts', for example, 'soil crusting and sealing', 'overland flow', 'rain erosion features', 'rill erosion' and 'gully erosion'. These central concepts are then placed under the heading 'Rain erosion features and processes'. Other central concepts are grouped under the headings 'Factors influencing rain erosion hazard', 'Factors in conservation planning' and 'Tools in conservation planning'. The terms themselves, when they are defined and described, are listed alphabetically and their equivalents are given in Spanish, French and German. The glossary was compiled over a number of years by six workers of different nationalities all of whom are well-known in the field of soil conservation.

The book is an extremely useful source of information and, as far as it goes, a good literature source. Photographs and diagrams are frequently used and are helpful in explaining the terms. The book deserves to be widely quoted because it defines more precisely the terms which are often used in a loose way in the literature.

In explaining and defining the terms, the basis for their further discussion, reassessment and refinement is given. For example, erosional processes and their manifestations (rainsplash, rainwash, braid, rill, gully) are defined here from studies in the laboratory or on field plots, but need to be related to information from field and catchment studies.

Moreover, the impact of soil degradation, which is mostly equated here with erosion (although the Universal Soil Loss Equation (USLE), and similar formulae, generally over-estimate erosion), does not adequately take into account the fact that the decline of soil fertility can often be attributed primarily to crops removing nutrients which, if not replaced by fertilizers, will lead to declining yields.

Unfortunately, because of the length of time taken to compile and publish the book, most references are dated 1986 and earlier, and none are dated later than 1992. The USLE and plot-scale approach to assessing erosion predominate. Thus, many of the more recently published field-based studies of erosion, which often measure erosion losses volumetrically rather than by weight, have not been considered. The section on modelling rain erosion and conservation is also seriously out of date.

There are far too many topographical and grammatical errors; numerous citations are given in the text but not in the references, or vice versa; and both imperial and metric units are used. However, even with all these errors, the book should be on the shelves of all those working on soil erosion and conservation. And the price is a bargain, at about \$US12 or £8 sterling.

R. EVANS

*Department of Geography
Anglia Polytechnic University*